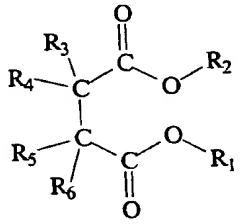
CLAIMS

1. A solid catalyst component for the polymerization of olefins CH_2=CHR, in which R is hydrogen or a hydrocarbyl radical with 1-12 carbon atoms, comprising Mg, Ti, halogen and an electron donor selected from succinates of formula (I):



(I)

wherein the radicals R_1 and R_2, equal to or different from each other, are a C_1-C_{20} linear or branched alkyl, alkenyl, cycloalkyl, aryl, arylalkyl or alkylaryl group, optionally containing heteroatoms; the radicals R_3 to R_6 equal to or different from each other, are hydrogen or a C_1-C_{20} linear or branched alkyl, alkenyl, cycloalkyl, aryl, arylalkyl or alkylaryl group, optionally containing heteroatoms, and the radicals R_3 to R_6 which are joined to the same carbon atom can be linked together to form a cycle; with the proviso that when R_3 to R_5 are contemporaneously hydrogen R_6 is a radical selected from primary branched, secondary or tertiary alkyl groups, cycloalkyl, aryl, arylalkyl or alkylaryl groups having from 3 to 20 carbon atoms.

2. Catalyst component according to claim 1 in which the electron donor compound of formula (I) is selected from those in which R_1 and R_2 are C_1-C_8 alkyl, cycloalkyl, aryl, arylalkyl and alkylaryl groups.

3. Catalyst components according to claim 2 in which R_1 and R_2 are selected from primary alkyls.

4. Catalyst component according to claim 1 in which the electron donor compound of formula (I) is selected from those in which R_3 to R_5 are hydrogen and R_6 is a branched alkyl, cycloalkyl, aryl, arylalkyl and alkylaryl radical having from 3 to 10 carbon atoms.

5. ~~Catalyst~~ The catalyst component according to claim 4 in which R_6 is a branched primary alkyl group or

a cycloalkyl group having from 3 to 10 carbon atoms.

6. Catalyst component according to claim 1 in which the electron donor compound of formula (I) is selected from those in which at least two radicals from R_3 to R_6 are different from hydrogen and are selected from C_1-C_{20} linear or branched alkyl, alkenyl, cycloalkyl, aryl, arylalkyl or alkylaryl groups optionally containing heteroatoms.

7. ~~Catalyst~~ The catalyst component according to claim 6 in which the two radicals different from hydrogen are linked to the same carbon atom.

8. ~~Catalyst~~ The catalyst component according to claim 6 in which the two radicals different from hydrogen are linked to different carbon atoms.

9. Catalyst component according to claim 8 in which the succinate of formula (I) is selected from diethyl 2,3-diisopropylsuccinate, diisobutyl 2,3-diisopropylsuccinate, di-n-butyl 2,3-diisopropylsuccinate, diethyl 2,3-dicyclohexyl-2-methylsuccinate, diisobutyl 2,3-dicyclohexyl-2-methylsuccinate, diisobutyl 2,2-dimethylsuccinate, diethyl 2,2-dimethylsuccinate, diethyl 2-ethyl-2-methylsuccinate, diisobutyl 2-ethyl-2-methylsuccinate, diethyl 2-(cyclohexylmethyl)-3-ethyl-3-methylsuccinate, diisobutyl 2-(cyclohexylmethyl)-3-ethyl-3-methylsuccinate.

10. ~~A solid~~ The catalyst component according to ~~any of the preceding claims~~ claim 1 in which the succinates are used in the form of pure stereoisomers.

11. ~~A solid~~ The catalyst component according to ~~any of the preceding claims~~ claim 1 in which the succinates are used in the form of mixtures of enantiomers, or mixture of diastereoisomers and enantiomers.

12. ~~A solid~~ The catalyst component according to claim ~~11~~ 9 in which diethyl 2,3-diisopropylsuccinate, diisobutyl 2,3-diisopropylsuccinate and di-n-butyl 2,3-diisopropylsuccinate are used as a pure *rac* or *meso* forms, or as mixtures thereof.

13. A solid catalyst component according to any of the preceding claims comprising a titanium compound having at least a Ti-halogen bond and the succinate of formula (I) supported on a Mg dichloride in active form.

14. ~~A solid~~ The catalyst component according to claim ~~10~~ 13 in which the titanium compound is $TiCl_4$ or $TiCl_3$.

15. A solid catalyst component according to any of the preceding comprising another electron

donor compound in addition to the succinate of formula (I).

16. A solid catalyst component according to claim 15 in which the additional electron donor compound is selected from ethers, esters of organic mono or bicarboxylic acids and amines.

17. A solid catalyst component according to claim 16 in which the additional electron donor compound is selected from the 1,3-propanediethers of formula (II) and esters of organic mono or bicarboxylic acids.

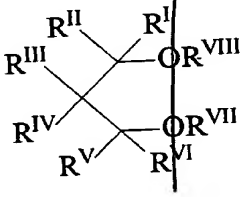
18. A solid catalyst component according to claim 17 in which the additional electron donor compound is selected from phthalates or the 1,3-diethers in which R^{VII} and R^{VIII} are selected from C_1-C_4 alkyl radicals, R^{III} and R^{IV} form a condensed unsaturated cycle and R^{I}, R^{II}, R^{V} and R^{VI} are hydrogen.

19. A catalyst for the polymerization of olefins CH_2=CHR, in which R is hydrogen or a hydrocarbyl radical with 1-12 carbon atoms, comprising the product of the reaction between:
- the solid catalyst component of any of the claims 1-18;
- an alkylaluminum compound and, optionally,
- one or more electron donor compounds (external donor).

20. ~~Catalyst~~ The catalyst according to claim 19 in which the alkylaluminum compound (b) is a trialkyl aluminum compound.

21. Catalyst according to claim 20 in which the trialkylaluminum compound is selected from triethylaluminum, triisobutylaluminum, tri-n-butylaluminum, tri-n-hexylaluminum, tri-n-octylaluminum.

22. Catalyst according to claim 19 in which the external donor (c) is selected from the 1,3-diethers of the general formula (II):



(II)

wherein R^I, R^{II}, R^{III}, R^{IV}, R^V and R^{VI} are equal or different to each other, hydrogen or hydrocarbon radicals having from 1 to 18 carbon atoms, and R^{VII} and R^{VIII}, equal or different from each other, have the same meaning of R^I-R^{VI} except that they cannot be hydrogen; one or more of the R^I-R^{VIII} groups can be linked to form a cycle.

23. ~~Catalyst~~ The catalyst according to claim 22 in which the 1,3-diethers are selected from those in which R^{VII} and R^{VIII} are selected from C_1-C_4 alkyl radicals, R^{III} and R^{IV} form a condensed unsaturated cycle and R^I, R^{II}, R^V and R^{VI} are hydrogen.

24. ~~Catalyst~~ The catalyst according to claim 23 in which the diether of formula (II) is 9,9-bis(methoxymethyl)fluorene.

25. Catalyst according to claim 19 in which the external donor (c) is a silicon compound of formula $R_a^7R_b^8Si(OR^9)_c$, where a and b are integer from 0 to 2, c is an integer from 1 to 4 and the sum (a+b+c) is 4; R^7, R^8 and R^9 are C1-C18 hydrocarbon groups optionally containing heteroatoms.

26. ~~Catalyst~~ The catalyst according to claim 25 in which a is 1, b is 1 and c is 2.

27. Catalyst according to claim 25 or 26 in which R^7 and/or R^8 are branched alkyl, cycloalkyl or aryl groups with 3-10 carbon atoms optionally containing heteroatoms and R^9 is a C_1-C_{10} alkyl group, in particular methyl.

28. ~~Catalyst~~ The catalyst according to claim 25 in which a is 0, c is 3 and R^8 is a branched alkyl or cycloalkyl group and R^9 is methyl.

29. A catalyst for the polymerization of olefins CH_2=CHR, in which R is hydrogen or a hydrocarbyl radical with 1-12 carbon atoms, comprising the product of the reaction between:

(i) a solid catalyst component comprising Mg, Ti, halogen and an electron donor (d);

(ii) an alkylaluminum compound and,

(iii) a succinate of formula (I).

30. ~~Catalyst~~ The catalyst according to claim 29 in which the succinate of formula (I) is selected from those in which at least two radicals from R_3 to R_6 are different from hydrogen and are selected from C_1-C_{20} linear or branched alkyl, alkenyl, cycloalkyl, aryl, arylalkyl or alkylaryl groups optionally containing heteroatoms.

31. ~~Catalyst component~~ The Catalyst according to claim 30 in which the two radicals different from

hydrogen are linked to different carbon atoms.

32. ~~Catalyst~~ The catalyst according to claim 29 in which the internal donor (d) is selected from ethers, esters of organic mono or bicarboxylic acids and amines.

33. Catalyst according to claim 32 in which the internal donor (d) is selected from the 1,3-propanediethers of formula (II) and esters of organic mono or bicarboxylic acids.

34. Catalyst according to claim 33 in which the internal donor (d) is selected from phthalates or the 1,3-diethers in which R^{VII} and R^{VIII} are selected from C_1-C_4 alkyl radicals, R^{III} and R^{IV} form a condensed unsaturated cycle and R^{I}, R^{II}, R^{V} and R^{VI} are hydrogen.

35. A prepolymerized catalyst component for the polymerization of olefins CH_2=CHR, wherein R is hydrogen or a C_1-C_{12} alkyl group, characterized by comprising a solid catalyst component according to claim 1-10 which has been prepolymerized with an olefin to such an extent that the amount of the olefin pre-polymer is from 0.2 to 500 g per g of solid catalyst component.

36. ~~Prepolymerized~~ The prepolymerized catalyst according to claim 35 in which the solid catalyst component has been prepolymerized with ethylene or propylene.

37. Process for the (co)polymerization of olefins CH_2=CHR, in which R is hydrogen or a hydrocarbyl radical with 1-12 carbon atoms, carried out in the presence of any of the catalysts of claims 19-36.

38. ~~Process~~ The process according to claim 37 in which the olefin to be (co)polymerized is selected from the group consisting of ethene, propene, 1-butene, 4-methyl-1-pentene and 1-hexene.

39. Propylene polymers characterized in that they have a polydispersity index of higher than 5, a content of isotactic units expressed in terms of pentads of higher than 97% and a flexural modulus of at least 2000 MPa.

40. Propylene polymers according to claim 39 in which the polydispersity index is higher than 5.1, the flexural modulus is higher than 2100 and the percent of propylene units in form of pentads is higher than 97.5%.